

ASSIGNMENT 11

Textbook Assignment: "Direct Leveling and Basic Engineering Surveys." Pages 14-1 through 14-25.

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| <p>11-1. Bench marks (BMs) share what common characteristic?</p> <ol style="list-style-type: none">1. They are permanent2. They are marked with a known elevation3. They are constructed only from concrete or brass4. They are used only for vertical control <p>11-2. To be used as elevation references in the development or expansion of a permanent naval station, you should establish monumented BMs in which of the following locations?</p> <ol style="list-style-type: none">1. On all important structures, such as buildings and piers2. At all road intersections3. In a grid system 1 mile apart4. In a grid system 1/2 mile apart <p>11-3. Level nets are established within a prescribed order of accuracy and are tied to what reference?</p> <ol style="list-style-type: none">1. A BM2. A traverse station3. A datum4. A horizontal control point <p>11-4. Mean sea level (MSL) differs from mean tide level (MTL) in what way?</p> <ol style="list-style-type: none">1. MSL is the mean of tides observed in the open sea; MTL is the mean of inland tidewater observations2. MSL is the result of averaging tabulated tide readings; MTL is taken from the tidal curve3. MSL is the mean of a large number of points along a tidal curve; MTL is the mean of only the high and low points along the tidal curve4. MSL is the datum used primarily in hydrographic surveys; MTL is used as a datum in any type of survey | <p>11-5. The correct way to obtain the MSL value for a month's tide tabulated record is to add all daily sums for the month and to divide this total by the sum of what specific units of time in that month?</p> <ol style="list-style-type: none">1. Minutes2. Days3. Hours4. Weeks <p>11-6. What datum is generally used for measuring the height of a hill?</p> <ol style="list-style-type: none">1. Mean sea level (MSL)2. Mean high water (MHW)3. Mean low water (MLW)4. Mean low water springs (MLWS) <p>11-7. Assume you are engaged in a hydrographic survey of the water approaches to Naval Air Station, Adak, Alaska. Your soundings should refer to what datum?</p> <ol style="list-style-type: none">1. MLLW2. MWL3. MTL4. MLWS <p>11-8. What type of lubricant is recommended for use on engineer's levels in arctic regions?</p> <ol style="list-style-type: none">1. Watch oil2. Powdered graphite3. Petroleum jelly4. Mineral oil <p>11-9. The proper way to remove an engineer's level from its carrying case is to grasp it firmly by what part(s)?</p> <ol style="list-style-type: none">1. The telescope2. The footplate3. The leveling head4. The wye rings <p>11-10. When a level setup must be transferred to another point or station, what screws should be loosened slightly?</p> <ol style="list-style-type: none">1. Leg and level2. Leg and clamp3. Level and clamp4. Tangent and clamp |
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11-11. To help the instrumentman obtain accurate readings, the rodman should take which of the following actions?

1. Clean the top of the point and the rod shoe for a good contact
2. Plumb with both hands
3. Make sure the rod graduations are right side up and facing the instrumentman
4. All of the above

11-12. The proper care of a leveling rod includes which of the following actions?

1. Supporting the entire rod on a flat surface when laying the rod down flat
2. Rinsing any mud off with water and cleaning any grease off with a mild soap solution
3. Wiping it dry before storing it in a dry place
4. All of the above

11-13. On what basis should you select setup points to balance your shots in differential leveling?

1. All setup points are at about the same elevation
2. Backsight distances are about the same as foresight distances
3. All backsight distances are about the same
4. All foresight distances are about the same

11-14. You are setting up an engineer's level on a concrete surface. You mount the instrument on a tripod placed inside a floor triangle. This precaution will protect the tripod from which of the following accidents?

1. Turning
2. Moving laterally
3. Tipping over
4. Collapsing

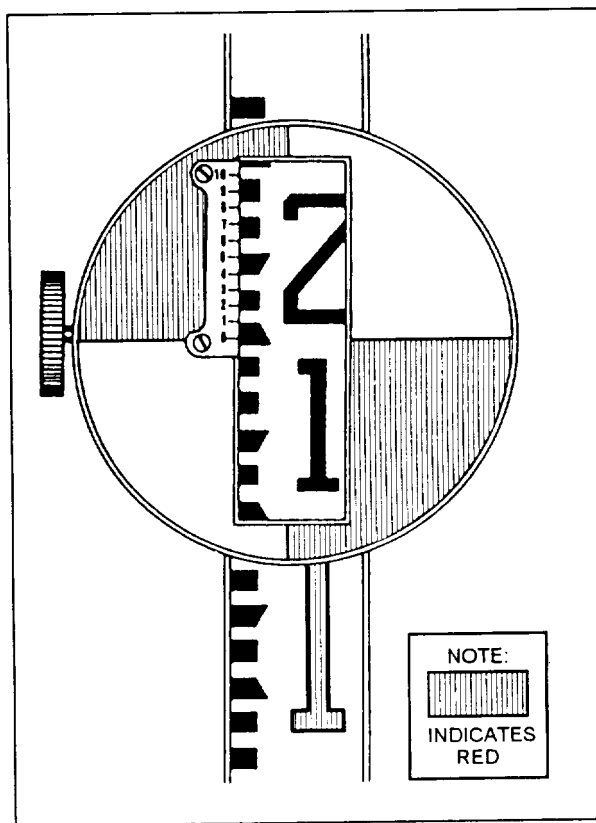
IN ANSWERING QUESTION 11-15, REFER TO FIGURE 14-7 IN YOUR TEXTBOOK.

11-15. In what direction does the level vial bubble move when you turn the level screws as indicated?

1. Up
2. Down
3. Right
4. Left

11-16. The whole foot numbers on a Philadelphia rod are what color?

1. Red
2. White
3. Black
4. Yellow



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Figure 11A

IN ANSWERING QUESTION 11-17 REFER TO FIGURE 11A.

11-17. What is the target reading?

1. 1.125 ft
2. 1.154 ft
3. 1.5 ft
4. 112.0 ft

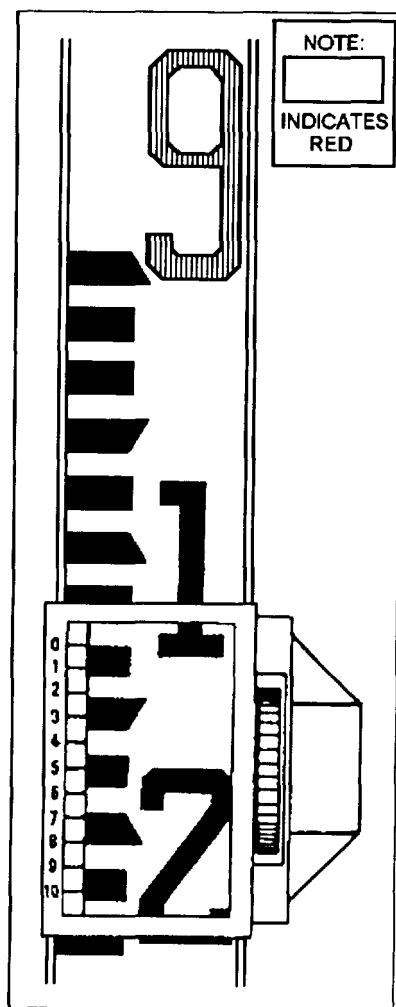


Figure 11B

IN ANSWERING QUESTION 11-18, REFER TO FIGURE 11B.

11-18. What is the target reading?

1. 8.128 ft
2. 9.120 ft
3. 9.128 ft
4. 279.0 ft

11-19. In leveling, which of the following statements best defines height of instrument (HI)?

1. The elevation of the horizontal line of sight
2. The vertical distance from the horizontal axis of the telescope to a point on the ground directly below the instrument
3. The vertical distance between the reference datum and the horizontal line of sight
4. The elevation of the reference datum minus the backsight rod reading

11-20. In determining the elevation of an unknown point, what arithmetic operation should you apply to the HI and FS?

1. Addition
2. Subtraction
3. Multiplication
4. Division

11-21. By using the technique of balancing shots, you can eliminate which of the following effect(s) in differential leveling?

1. Instrumental error
2. Curvature of the earth's surface
3. Atmospheric refraction
4. All of the above

11-22. When turning points are being set up in ordinary precision leveling, what should be the maximum distance between the instrument and a TP?

1. 200 ft
2. 300 ft
3. 600 ft
4. 1,000 ft

11-23. When turning points are located in sandy soil, you must set the level rod on a base. Which of the following bases is an acceptable choice?

1. A turning point plate
2. A turning point pin driven into the soil
3. A marlin spike driven into the soil
4. Each of the above

11-24. The original level run is rapidly rerun as a check in what type of leveling procedure?

1. Three-wire
2. Cross-section
3. Profile
4. Flying

LEVEL CIRCUIT FROM						K -	E A 2	ROLFING
BM. 35 to BM. 19						Rod -	E A 3	BAKER
						Ret -	E A 3	JONES
						Bd B Dumpy #31057		
Sta.	B.S. +	H.I.	F.S. -	Elev.	Sights B.S. ES	cloudy moderate wind		
						June 30, 19__ (3 hrs)		
35	6.35			100.02	220	Concrete monument B.M.		
16	4.66		4.67	101.7	250 220	Peg		
17	4.20		7.15		310 250	"		
18	1.11		5.55		100 310	"		
TP #1	6.77		0.98		190 100	Rock outcrop, turning point		
19			1.48		190	Concrete monument B.M. = 103.20		

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Figure 11C

IN ANSWERING QUESTIONS 11-25 THROUGH 11-30, REFER TO FIGURE 11C.

11-25. What is the HI at station 16?

1. 100.02 ft
2. 106.35 ft
3. 106.36 ft
4. 106.37 ft

11-26. What is the elevation of turning point #1?

1. 97.96 ft
2. 97.99 ft
3. 103.76 ft
4. 104.76 ft

11-27. What is the elevation of BM 19 as computed from the field notes?

1. 101.28 ft
2. 102.38 ft
3. 103.28 ft
4. 104.76 ft

11-28. What is the computed difference in elevation between BM 35 and BM 19?

1. 2.26 ft
2. 3.26 ft
3. 4.26 ft
4. 4.36 ft

11-29. What is the error of closure of the level circuit?

1. 0.08
2. 0.10
3. 3.18
4. 3.26

11-30. When corrected for error of closure, what is the adjusted elevation of TBM 17?

1. 99.17 ft
2. 99.25 ft
3. 101.67 ft
4. 101.75 ft

11-31. Simultaneous-reciprocal leveling requires which of the following level party personnel?

1. One levelman and one rodman
2. One levelman and two rodmen
3. Two levelmen and one rodman
4. Two levelmen and two rodmen

11-32. In profile leveling, rod readings taken from points that are neither BMs nor TPs are entered under what heading in the field notebook?

1. BS
2. FS
3. IFS
4. Remarks

11-33. You have run a line of levels from an initial BM to a final BM. You compute the elevation of the final BM to be 1,475.77 feet. The elevation of the initial BM is 1,502.36 feet. If the sum of the backlights is 16.32 feet, what is the sum of the foresights?

1. 10.27 ft
2. 26.59 ft
3. 32.06 ft
4. 42.91 ft

11-34. At what point(s) along a proposed highway are cross sections taken?

1. Every 25 ft
2. Every 50 ft
3. At regular stations only
4. At regular stations, at any point where there is a break on the ground, or at any interval desired

11-35. By which of the following methods is the HI in cross-section leveling determined when using a hand level?

1. By adding the instrumentman eyesight height to the center-line elevation from profile field notes
2. By adding the instrumentman eyesight height to a BM elevation
3. By adding the BS reading to a BM elevation
4. Each of the above

11-36. You are doing cross-section leveling for a highway road survey. The profile center-line elevation at station 25 + 00 is 112.5 feet and eye height is 5.3 feet. On a rod held 20 feet from the center line you read 11.2 feet. What is the elevation at this point?

1. 96.0 ft
2. 106.6 ft
3. 118.4 ft
4. 129.0 ft

11-37. What is a form of differential leveling in which a continuous check is maintained on the accuracy of the leveling procedure?

1. Three-wire
2. Double rodding
3. Cross-section
4. Profile

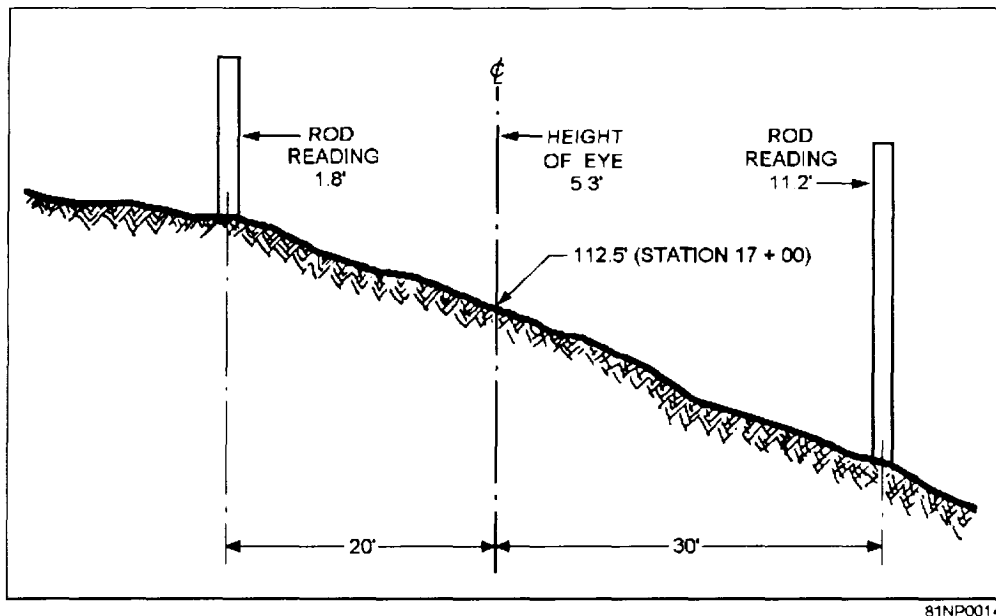


Figure 11D

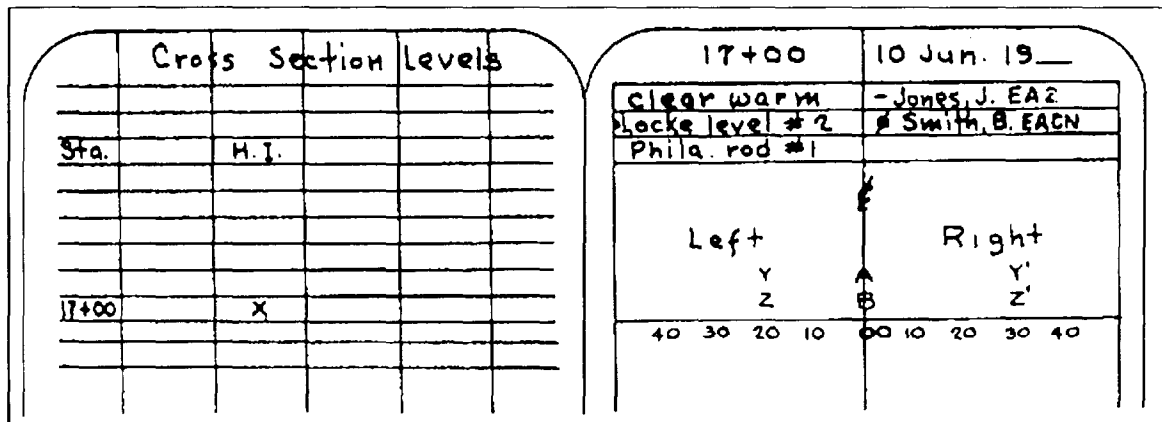


Figure 11E

IN ANSWERING QUESTIONS 11-38 THROUGH 11-41, REFER TO FIGURES 11D AND 11E.

11-38. What numerical values from figure 11D replace the letters A and B, respectively, in figure 11E?

1. 1.8; 11.2
2. 5.3; 112.5
3. 11.2; 1.8
4. 112.5; 5.3

11-39. What numerical value replaces the letter X in figure 11E?

1. 11.2
2. 107.2
3. 112.5
4. 117.8

11-40. What numerical values replace the letters Z and Z', respectively, in figure 11E?

1. 1.8; 11.2
2. 5.3; 112.5
3. 11.2; 1.8
4. 112.5; 5.3

11-41. What numerical values replace the letters Y and Y', respectively, in figure 11E?

1. 106.6; 116.0
2. 112.5; 117.8
3. 116.0; 106.6
4. 117.8; 112.5

11-42. If third order accuracy is specified, what is the maximum allowable error of closure for a level loop that is 7,826 feet long?

1. 0.042 ft
2. 0.061 ft
3. 0.608 ft
4. 4.423 ft

11-43. Recording a rod reading in the wrong column in a field book is classified as a

1. mistake
2. standard error
3. personal error
4. natural error

IN ANSWERING QUESTIONS 11-44 THROUGH 11-48, SELECT FROM THE FOLLOWING LIST THE CORRECTIVE MEASURE THAT YOU SHOULD TAKE DURING A LEVELING OPERATION TO AVOID ERRORS RESULTING FROM THE SITUATION GIVEN.

- A. BALANCE BS AND FS DISTANCES
B. CALIBRATE ROD LENGTH
C. USE A TURNING POINT
D. AVOID VERY SMALL ROD READING

11-44. Level not in adjustment.

1. A
2. B
3. C
4. D

11-45. Unstable TP.

1. A
2. B
3. C
4. D

11-46. Wear and tear evident on the bottom of the rod.

1. A
2. B
3. C
4. D

11-47. Earth's curvature.

1. A
2. B
3. C
4. D

11-48. Atmospheric refraction.

1. A
2. B
3. C
4. D

11-49. Between errors and mistakes, the most importance difference, if any, is that

1. errors can be avoided
2. errors are caused by human negligence
3. mistakes can be avoided
4. there is no difference; the terms are synonymous

11-50. In third-order leveling, the starting and closing BMs must be of which of the following orders of accuracy?

1. First
2. Second or higher
3. Third or higher
4. Fourth or higher